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(54) TELEVISION RECEPTION SYSTEM FOR RECOMMENDING BROADCAST
PROGRAM VIEWING, SERVER APPARATUS, BROADCAST PROGRAM VIEWING
RECOMMENDATION PROCESSING METHOD, PROGRAM THEREOF, AND
RECORDING MEDIUM FOR THE PROGRAM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a system for recommending or controlling
selection of a particular channel or program to a viewer on the basis of the preference of
the viewer in use and a view tendency of majority of viewers having the preference
similar to that of the viewer.

SOLUTION: A television receiver 1 transmits a past view history of a viewer and a current or future view state to a server 2. The server 2 classifies in detail the preference of the television viewer from many view histories, classifies the viewers into groups, discriminates which program a particular viewer group mainly views at present or in future according to majority logic, and returns the result to the television receiver 1. Thus, the television receiver 1 can control channels of television programs so that other viewer with the same preference can quickly view the same program.

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CLAIMS

[Claim(s)]

[Claim 1]Via a communications network to two or more broadcast receiving sets and those broadcast receiving sets. Are a television reception system which comprises a server apparatus which encourages viewing and listening of a program, and said each

broadcast receiving set, A means to transmit viewing history information including information which can specify a program to which a televiewer viewed and listened to said server apparatus, A means to transmit information on to which channel or program it is viewing and listening now to said server apparatus, A means to require ranking information of said server apparatus by a televiewer's operation, Ranking information of a program from said server apparatus. Have a means to choose a means to receive, and a channel or a program which views and listens to received ranking information based on ranking information outputted or received, and said server apparatus, A means to receive and accumulate viewing history information from said each broadcast receiving set, and a means to classify a televiewer into some groups based on accumulated viewing history information, A means to collect information on to which channel or program each televiewer's broadcast receiving set is viewing and listening now, Having a means to total a present viewing-and-listening channel or a program, and to ask for ranking, and a means to turn a ranking result to a televiewer's broadcast receiving set, and to send it out, for said each [which was classified] televiewer group of every The feature. A television reception system which encourages viewing and listening of broadcast to carry out.

[Claim 2]In a television reception system to encourage, viewing and listening of the broadcast according to claim 1 said broadcast receiving set, Have a means which can reserve a channel or a program to which it will view and listen in the future, and a means to transmit a channel or a program which will be a viewing-and-listening schedule in the future to said server apparatus, and said server apparatus, A means to collect information on a channel which is information and a future viewing-and-listening schedule to which channel or program each televiewer's broadcast receiving set is viewing and listening now, or a program, A means to total the present viewing-and-listening channel or a program and a future viewing-and-listening schedule channel, or a program, and to ask for ranking for said each [which was classified] televiewer group of every, A television reception system which encourages viewing and listening of broadcast provided with a means to turn a ranking result to a televiewer's broadcast receiving set, and to send it out.

[Claim 3]A means to receive and accumulate viewing history information which is a server apparatus which encourages viewing and listening of a program via a communications network to two or more broadcast receiving sets, and includes information which can specify a program to which a televiewer viewed and listened from each broadcast receiving set, A means to classify a televiewer into some groups based on accumulated viewing history information, A means to collect information on

information on to which channel or program each televiewer's broadcast receiving set is viewing and listening now, a channel which will be a viewing-and-listening schedule further in the future, or a program, A means to total present viewing-and-listening channel, program, channel that will be viewing-and-listening schedule further in the future, or program, and to ask for ranking for said each [which was classified] televiewer group of every, A server apparatus which encourages viewing and listening of broadcast provided with a means to turn a ranking result to a televiewer's broadcast receiving set, and to send it out.

[Claim 4]In a server apparatus which encourages viewing and listening of the broadcast according to claim 3, a means to classify said televiewer into a group, A server apparatus which encourages viewing and listening of broadcast classifying a televiewer by expressing the feature about a program to which a televiewer viewed and listened by a vector, and using a vector quantization algorithm.

[Claim 5]A process in which viewing history information which is the method of encouraging viewing and listening of a program with a server apparatus connected via a communications network to two or more broadcast receiving sets, and includes information which can specify a program to which a televiewer viewed and listened from each broadcast receiving set is received and accumulated, A process in which a televiewer is classified into some groups based on accumulated viewing history information, A process in which information on information on to which channel or program each televiewer's broadcast receiving set is viewing and listening now, a channel which will be a viewing-and-listening schedule further in the future, or a program is collected, A process in which total present viewing-and-listening channel, program, channel that will be viewing-and-listening schedule further in the future, or program, and it asks for ranking for said each [which was classified] televiewer group of every, A broadcast viewing-and-listening recommendation disposal method having a process in which turn a ranking result to a televiewer's broadcast receiving set, and it is sent out.

[Claim 6]A broadcast viewing-and-listening recommendation disposal method classifying a televiewer according to a process in which said televiewer is classified into a group, in the broadcast viewing-and-listening recommendation disposal method according to claim 5 by expressing the feature about a program to which a televiewer viewed and listened by a vector, and using a vector quantization algorithm.

[Claim 7]By computer of a server apparatus connected via a communications network to two or more broadcast receiving sets. Processing which receives and accumulates viewing history information which is a program for encouraging viewing and listening of

a program, and includes information which can specify a program to which a televiewer viewed and listened from each broadcast receiving set, Processing which classifies a televiewer into some groups based on accumulated viewing history information, Processing which collects information on information on to which channel or program each televiewer's broadcast receiving set is viewing and listening now, a channel which will be a viewing-and-listening schedule further in the future, or a program, Processing which totals present viewing-and-listening channel, program, channel that will be viewing-and-listening schedule further in the future, or program, and asks for ranking for said each [which was classified] televiewer group of every, A broadcast viewing-and-listening recommendation processing program for making a computer perform processing which turns a ranking result to a televiewer's broadcast receiving set, and sends it out.

[Claim 8]By computer of a server apparatus connected via a communications network to two or more broadcast receiving sets. Processing which is the recording medium which recorded a program for encouraging viewing and listening of a program, and receives and accumulates viewing history information from each broadcast receiving set, Processing which classifies a televiewer into some groups based on accumulated viewing history information, Processing which collects information on information on to which channel or program each televiewer's broadcast receiving set is viewing and listening now, a channel which will be a viewing-and-listening schedule further in the future, or a program, Processing which totals present viewing-and-listening channel, program, channel that will be viewing-and-listening schedule further in the future, or program, and asks for ranking for said each [which was classified] televiewer group of every, A recording medium of a broadcast viewing-and-listening recommendation processing program recording a program for making a computer perform processing which turns a ranking result to a televiewer's broadcast receiving set, and sends it out.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]A television set, a video recording device (these.) which contained the television tuner in which this invention can receive two or more broadcast channels, or such a television tuner [name generically and] It is related with the television reception system and server apparatus which encourage viewing and listening of broadcast which encourages viewing and listening based on the result of having classified the televiewer's taste for calling it a broadcast receiving set, a broadcast viewing-and-listening recommendation disposal method, its program, and the recording medium of the program.

[0002]

[Description of the Prior Art]Television broadcasting is diversified and in recent years A terrestrial wave, a broadcasting satellite wave (BS), a communications satellite wave (CS), It can choose, view and listen now to the program which can receive broadcast now from various channels, such as cable TV (CATV) and a broadband communication network (BB), and ranges from these broadcasts also to hundreds of channels. In the broadcast environment diversified in this way, the televiewer can use the electronic program guide (EPG) which can specify immediately the program which wants to grasp, view and listen to the present and future contents of broadcast on TV footage, and a channel. Out of many broadcast channels, a televiewer checks the program which he wants to watch most by the text of EPG, or a performer list, and can set, view and listen to a channel immediately.

[0003]It not only can tell a televiewer the contents broadcast now, but since EPG can carry out the notification of audit also of the future broadcast plan, it can use it for a future television reception request to print out files and the reservation of picture recording of video. Even if it does not depend on EPG, the televiewer can view and

listen to a TV program with various gestalten, such as using together the method of switching many channels for a short time, and viewing and listening to them until it reaches the broadcast channel which is commonly called zapping and to like.

[0004]By the way, the channel selection method by zapping is an effective technique in order to make new "encounter" of a program and a televiewer, but is probable, and is not necessarily the optimal viewing-and-listening means. [of whether it meets with the program which a televiewer wants to watch at the moment of carrying out zapping] That is, although there was the program or channel to which a televiewer wants to view and listen originally, since the channel was not encountered in a zapping process, it may overlook. Or since the popular degree cannot be grasped subjectively and objective only by glimpse zapping even if there is a hit program prominent in a televiewer group with a specific taste, the technical problem which alienates some televiewers from fashion or a subject share also remains.

[0005]If such a technical problem is taken into consideration, in the age of multichannel broadcasts, the method of encouraging or controlling a televiewer's channel selection can also be set to one of the broadcast business from the side to broadcast.

[0006](2) by which the reason shortens the time of a fluid televiewer's zapping, and the (1) viewing-and-listening purpose derives it to a target program and channel quickly, in order to present a subject share of a televiewer group with the same taste, (3) derived to the program and channel which a large majority of televiewer is looking at -- as a result of these, It is because the effect of making a large majority of televiewer staying to a fixed channel for a long time, and trying to increase of income of a subscription fee if it is the increase in the advertising revenue by CM televising with an eye on such a televiewer or a charged view program is acquired. Such an effect can be used as one of the business using the broadcasting station and a televiewer's bidirectional relation which are called "broadcast portal service."

[0007]The problem which should be solved since the above business is materialized is about whether they are contents to which the channel which it is going to show from the broadcasting station side meets a televiewer's taste. Even if a televiewer's taste is various, and a channel is compulsorily controlled from the broadcasting station side or it strikes recommendation by program propaganda, The way which is the contents in alignment with a large majority of televiewers' viewing-and-listening situation where the contents of broadcast have the taste same in being contents as a televiewer in alignment with the televiewer's viewing-and-listening situation so far, If compared with presentation of a recommended channel without an antecedent basis, it is

accepted that a televiewer does not have sense of incongruity, and the situation of being easy to set a channel in consideration of a position subject shared [for a televiewer] and can be made.

[0008]

[Problem(s) to be Solved by the Invention]It is more desirable for the televiewer who enjoys the effect of this invention to understand the taste experientially beforehand. Namely, not only in an external classification like the age which can be deduced from the purchaser information of a television set, etc., and sex for example, If it is viewing and listening to television in which time zone or of what kind of genre he likes a program or whether it liking, viewing and listening to the news program of which channel, and a viewing inclination have distinguished a priori, which program should be encouraged to the televiewer can narrow down experientially out of various broadcasts. The taste trend can be presumed from the televiewer's old viewing history.

[0009]When the program encouraged in connection with other televiewers' viewed contents is determined from a subject shared viewpoint, after this televiewer classifies first of what kind of taste he is a televiewer based on a viewing history, It presumes to which program other televiewers in the same classification view and listen the present or in the future by the method by majority logic, and the method which encourages the program can be considered. Although there may be some methods in a televiewer group method, if it can consider that a televiewer's taste situation is vector data according to a normal distribution, the classification method by vector quantization is applicable.

[0010]In the television set and video recording device which contained the television tuner in which this invention can receive two or more television broadcasting programs, or such a television tuner, It is based on the viewing inclination of a large majority of televiewers with the taste of the televiewer who uses, and the same taste as the televiewer, and aims at providing the system which encourages or controls selection of a specific channel or a program to a televiewer.

[0011]

[Means for Solving the Problem]This invention classifies a TV viewer's taste finely, and when it has grasped to which program a televiewer group of specific taste is viewing and listening, it controls a channel of television so that another televiewer of the same taste can also view and listen to an identical program promptly.

[0012]Therefore, a television set sends out a future viewing history [of a televiewer's past], present, or viewing-and-listening situation to a server. A server classifies a

televIEWER into a group from many viewing histories, judges by majority to which program a specific televIEWER group will mainly view and listen now or in the future, returns it to a television set, and controls the viewing-and-listening channel.

[0013]Specifically a communications network passes a server which supplies an electronic program guide and channel-control information, for example to a television set and a television set, this invention is connected, and a television set and a server are constituted as follows, respectively.

[0014]A circuit where a television set sends out a peculiar ID number for every individual, and a timer which measures current time, A memory part which accumulates an electronic program guide, and a switch which chooses a receiving channel by operation of human being, A circuit which accepts directions from an external server and controls a receiving channel, A television broadcasting tuner which can change a receiving channel based on control, A communication circuit which sends out channel information under present reception to an external server, and a memory which accumulates the past channel selection history, A communication circuit which sends out the history to an external server, and a switch which requires ranking information of an external server by a televIEWER's operation, It comprises a memory which receives ranking information by communication with an external server, and is memorized, a circuit which displays ranking information, and an indicator and a voice response circuit which turn an output of a television tuner and ranking information to a televIEWER, and display it.

[0015]The communications department which the server can communicate with a television set installed in each viewing-and-listening household, A memory which accumulates each televIEWER's viewing history, respectively, and a calculation part which classifies a televIEWER based on a viewing history and a discriminant, A memory which classifies each televIEWER as a group and accumulates him based on a standard of classification, A memory which collects information on which channel each televIEWER's television set has chosen now, It comprises a calculation part which totals the present viewing-and-listening channel in majority form, a calculation part which generates higher rank ranking of a broadcast channel based on the totaled result, and a circuit which turns the ranking result to each televIEWER's television set, and sends it out for every televIEWER group.

[0016]A television set as the developed type as a control system of a receiving channel of a television broadcasting tuner, A circuit which accepts operation of human being or directions from an external server, and can reserve a channel which will be a viewing-and-listening schedule in the future, Add, and a communication circuit which

sends out not only channel information under present reception but channel information which will be a viewing-and-listening schedule in the future to an external server is constituted, and a server, A memory which gathers information not only about which channel each televiewer's television set has chosen now but about a channel which will be a viewing-and-listening schedule in the future, For every televiewer group, a calculation part which totals a present viewing-and-listening channel and a future viewing-and-listening schedule channel in majority form, and a calculation part which generates higher rank ranking based on the totaled result are added, and it is constituted.

[0017]If information on an electronic program guide can furthermore be used together, the ranking result shown to a televiewer can present information on the program itself instead of a channel.

[0018]To a televiewer group's classifying method, it uses that a viewing history is vector data, and a vector quantization algorithm is applied.

[0019]The operation of this invention is as follows. In a television set which applied this invention, if a televiewer does fixed time use, a television set accumulates a viewing history which consists of information, including time, a channel, a program genre, etc., to which it viewed and listened, and sends it out to a server. Based on a sent-out viewing history, these televiewers are classified into two or more groups according to a server by a statistical technique. For every specific televiewer group, in the present or a future, a televiewer belonging to the televiewer group obtains again to what kind of program it views and listens from a television set, and totals a server in majority form. About ranking of a popular channel obtained by the result, information sending of the server is carried out to each television set, and it encourages selection of a channel to a televiewer, or controls it to set a channel. The same recommendation and channel control become possible also about a program to which it will view and listen in the future.

[0020]

[Embodiment of the Invention]The embodiment of the television reception system which consists of the television set and server which carry out this invention is shown in drawing 1.

[0021]First, an outline is explained. Each televiewer's television set 1 sends the viewing history of one week of past to the server 2, for example. The server 2 classifies a televiewer from many received viewing histories. This classification is performed as follows. If it catches by vector data called [what the televiewer is looking at and] a program viewing history, a normal distribution set will be drawn. If

the televiewer is rapidly subdivided using the function which distinguishes a normal distribution (vector quantization), each constitutes the televiewer layer describing a uniform normal distribution in the lump. This lump's each is classified as a group. or [that, as for the server 2, the people of that televiewer layer will look at what now or in the future based on this televiewer classification] -- the majority ranking total of the ** is carried out. The ranking result is notified to the television set 1. In the television set 1, the ranking result is displayed, for example on the televiewer under zapping. A channel will be compulsorily changed by a case. Thereby, viewing and listening of the program suitable for the televiewer's taste can be encouraged.

[0022]Each part of drawing 1 is explained in detail. The television set 1 obtains electronic program guide information from the external server 2, can obtain information, including the channel of the program which the televiewer is watching, or the program which he is going to watch, a time zone, a genre, etc., and with the directions from the server 2. It is a device in which the control which displays these program information on a screen as recommendation information from the server 2, and sets a channel by the program, or reserves viewing and listening of the program is possible.

[0023]The tuner unit 11 is a receiving circuit which is based on the channel change directions from an external circuit, sets a television broadcasting channel, gets over thru/or decodes, and acquires a television picture signal and an audio signal.

[0024]The picture display part 12 is a circuit which turns the output of the tuner unit 11, and the output of the ranking information indicator 26 to a televiewer, and displays them, and is constituted by a cathode-ray tube, color liquid crystal panel, etc., for example. The voice output part 13 is a circuit which amplifies the output sound of the tuner unit 11 and is reproduced towards a televiewer, and is constituted by an audio amplifier, loudspeaker, etc., for example.

[0025]The communications department 14 is a circuit which connects an internal circuit and the external server 2 via a communications network, and a communication method is ISDN or Ethernet (registered trademark). The peculiar ID generation part 15 is a memory which memorizes and sends out each peculiar ID of the television set 1. The timer 16 is a system timer of the television set 1 which clocks the present time of the television set 1.

[0026]The electronic program guide accumulating part 17 is a memory which once accumulates the electronic program guide information sent out from the server 2. The channel selection section 18 is a switch which changes the receiving channel of the tuner unit 11 based on operation of the televiewer using the television set 1.

[0027]The channel subscription department 19 will be an electronic circuit which changes the receiving channel of the tuner unit 11, if the timer 16 becomes predetermined time based on the information of the channel selection section 18 or the ranking information receive section 25. The channel control unit 20 is an electronic circuit which changes the receiving channel of the tuner unit 11 based on the information of the ranking information receive section 25.

[0028]The present viewing-and-listening channel sending part 21 is a circuit which sends out the channel information specified by the channel selection section 18, or the future viewing-and-listening reserved information accumulated in the channel subscription department 19 now based on the demand of the server 2.

[0029]The viewing history accumulating part 22 is a memory which carries out fixed time accumulation of the peculiar ID generation part 15, the timer 16, and the three information from the channel selection section 18. The hysteresis information sending part 23 is a communication circuit which sends out the viewing history accumulated by the viewing history accumulating part 22 to the server 2. The ranking information demand switch 24 is a switch which requires ranking information of the server 2 by a televiewer's operation. The ranking information receive section 25 is a memory which receives ranking information by communication with the server 2. The ranking information indicator 26 is a circuit which displays the received ranking information.

[0030]The server 2 is a server apparatus of electronic program guide information connected via each televiewer's television set 1 and communications network. The communications department 31 is a circuit which connects the internal configuration of the server 2, and the external television set 1 by communication, and a communication method is ISDN or Ethernet.

[0031]The viewing history accumulating part 32 is a means to accumulate each televiewer's viewing history sent out from the hysteresis information sending part 23 of each television set 1, respectively. The televiewer distinction calculation part 33 is a calculation part which carries out situation discrimination processing of all the televiewers finely based on a viewing history. The televiewer classification part 34 is a means to classify and accumulate each televiewer who accumulated in the viewing history accumulating part 32 based on the standard classified according to the televiewer distinction calculation part 33.

[0032]The present viewing information demand part 35 is a means to collect the information on whether choose which channel now or the viewing-and-listening request to print out files is made in the future to each televiewer's television set 1, and to accumulate in it for every televiewer. The viewing-and-listening channel voting

parts 36 are calculation parts which total the present viewing channel information or future viewing-and-listening reserved information of each viewer who accumulated in the present viewing information demand part 35 in majority form for every viewer group.

[0033]The ranking total part 37 is a calculation part which generates higher rank ranking for every viewer group based on the totaled result of the viewing-and-listening channel voting parts 36. The ranking result sending part 38 is a communication circuit which sends out the totaled result of the ranking total part 37 towards each viewer's television set 1. The electronic program guide sending part 39 is a circuit which keeps the file which electronized the program guide etc. which came to hand from the broadcasting station group 3, and is sent out to the television set 1 according to a demand.

[0034]The broadcasting station group 3 is electronic program guide information a broadcasting station of a large number to provide, and the broadcast voice, For example, it is a terrestrial wave, a broadcasting satellite wave (BS), a communications satellite wave (CS), cable TV (CATV), and a broadband communication network (BB), and the contents of broadcast are sent out via an electric wave, an optical cable, etc. to the television set 1. The broadcasting station group 3 provides electronic program guide information to the server 2 via a communications network.

[0035]Hereafter, operation of a 1st embodiment is explained. If a viewer operates the channel selection section 18 of the television set 1 and receives the electric wave of a terrestrial wave, BS, CS, CATV, or BB, the electronic program guide sending part 39 of the server 2 sends out the guide information on the program to which it is viewing and listening to the electronic program guide accumulating part 17 of the television set 1 now. Whenever this is viewing and listening, it may be sent out a priori beforehand. At this time, the selection situation of a viewer's channel is accumulated in order of the time series of a certain time interval to the viewing history accumulating part 22.

[0036]For example, what is necessary is just to memorize a ≈ 2016 kind channel selection situation in one week for $60 \text{ minute} / 5\text{-minute} \times 24 \text{ hours} \times \text{seven days}$ noting that the timer 16 records the channel to which measured the time in every 5 minutes, and beyond fixed time was viewed in the 5 minutes and listened best and which made 3 minutes or more the threshold, for example. Since date information is the order of a time series at a meaning, the contents recorded at this time are the genres of a channel number and the program to which it was viewing and listening then as what is contained inevitably, for example. Program genre information can be quoted

from the electronic program guide accumulating part 17, for example, may be the classification of rough genres, such as a drama, news, a sport, culture, and education. [0037]Although the time zone which is not using the television set 1 may also exist, it records that the contents of channel selection have no relevance at this time. Although there may also be a zapping state which switches two or more channels to the inside of a short time, it records having no relevance in a similar manner also in this case.

[0038]As a more concrete example, it diagrams to drawing 2 about the relation between the channel to which it was actually viewing and listening, and the channel number which should be recorded by the viewing history accumulating part 22. In drawing 2, since it is viewed and listened to the channel A 3 minutes or more about 5 minutes from 10:00, the viewing history accumulating part 22 memorizes 1. Although viewed and listened to the channel D for a long time in 3 minutes or more about 15 minutes from 10:05, The channel which should record the time interval of two pieces about 10 minutes from 10:05 since it is straddled, viewed and listened presupposes that he has no relevance, and, on the other hand, makes the longest channel B a recording object in this time about 15 minutes from 10 minutes. Hereafter, about 20 minutes and 20 to 25 minutes, the channel C serves as a recording object from 10:15, respectively.

[0039]Thus, the viewing history accumulating part 22 memorizes the channel sampled with the certain time interval. At the hysteresis information sending part 23, every fixed time, for example, the information accumulated per week, is sent out to the server 2 by the viewing history accumulating part 22. In the viewing history accumulating part 32 of the server 2, the channel selection situation for one week is first changed into histogram form about the received data. For example, if a classification of a horizontal axis is made into a broadcasting station name and the combination of a genre and a vertical axis is made into the amount of viewing time, Characterization of having viewed [a certain televiewer / at one week / for between what 10 minutes / for between what 10 minutes / for what 10 minutes] and listened [when] the drama program of the channel B for the news program of the channel A to the variety program of the channel C when can be taken.

[0040]It can be considered that this histogram data is a feature vector with the number of channels, and the number of dimension of the number of the combination of a genre. That is, if the number of channels made applicable to a total, for example considers it as eight genre part injuries by 12, the number of dimension of a vector will amount to 96 dimensions. If the viewing history for 10,000 sets was able to be taken

from the television set in which the server 2 and connection are possible at this time, the vector data of 10,000 samples will be accumulated in the server 2.

[0041]Next, these viewers are classified according to the server 2. The classification method can apply the technique of vector quantization (VQ) famous as a classification method of vector data. An example of the technique of VQ known as a "LBG algorithm" below is explained. Here, the feature vector by which a viewer is characterized is set to y .

[0042](1) Calculate average value y_{mean} about a set $\{y\}$ of the feature vector of 10,000 samples accumulated in the server 2. Since the typical vector by which a set $\{y\}$ of a feature vector is characterized at this time is one of y_{mean} , M which becomes $M=1$ is defined.

[0043](2) Generate two vector $y_{mean} + \epsilon$ which approached y_{mean} next, and $y_{mean} - \epsilon$. ϵ is a vector with a small value for division here.

[0044](3) Next, about the feature vector of 10,000 samples of the original, distinguish by calculation which [of $y_{mean} + \epsilon$ and $y_{mean} - \epsilon$] it is a vector near, and divide a set $\{y\}$ of a feature vector into a set of $2M$ piece. the technique of distinction -- each feature vector y -- a square -- distance d_p , d_m , and $d_p = |y - (y_{mean} + \epsilon)|^2$, $d_m = |y - (y_{mean} - \epsilon)|^2$ being computed, respectively, and, It is made subordinate to a set of the vector of a small distance value by which distance of d_p and d_m is small. As a result, a set $\{y\}$ of a feature vector can be divided into the set $\{y_p\}$ near $y_{mean} + \epsilon$, and the set $\{y_m\}$ near $y_{mean} - \epsilon$.

[0045](4) If it asks for the average value $\{y_{p_mean}\}$ in each set, and $\{y_{m_mean}\}$, it will mean that the typical vector by which a set $\{y\}$ of a feature vector is characterized had increased to two, and the value of M will be set to $M=2M$.

[0046]Below, about $\{y_{p_mean}\}$ and $\{y_{m_mean}\}$, processing of the above (2), (3), and (4) is repeated, and a set of N final feature vectors $\{y_{mean}\}$ is obtained until the number of M is in agreement with several N to classify a viewer group into N . $\{y_{mean}\}$ is a vector by which the vector data of 10,000 samples, i.e., a viewer, is characterized.

[0047]To this $\{y_{mean}\}$, the viewer of 10,000 samples calculates which $\{y_{mean}\}$ it is the existence near by the above-mentioned discriminant of (3), and classifies. Since peculiar ID for every television set given in the peculiar ID generation part 15, respectively is embedded, the value of the viewer group who classified, and peculiar ID, i.e., a viewer, are related with a meaning, and he is made to the viewer data of 10,000 samples. If this viewer group's classification is completed, it will go into the actual operation which controls the channel of each television set 1 from the server 2.

[0048]From each television set 1 classified into the specific televiewer group, the present viewing information demand part 35 of the server 2 is a constant interval, for example, a 5-minute interval, and requires sending out of the future viewing-and-listening reserved channel number stored in the channel number and the television set 1 under present viewing and listening. The present viewing-and-listening channel sending part 21 of the television set 1 receives the demand of the server 2, and sends out channel information with a demand.

[0049]At the server 2 which received, the channel under present viewing and listening is totaled with the voting method of majority form by the viewing-and-listening channel voting parts 36. As a majority form, it is good also as one vote per television set, and may be multiplied by preponderant weighting, for example as the televiewer of the existence near a typical vector $\{y_{mean}\}$. A channel number is extracted from these ballot results like the channel to the 10th place of a ranking higher rank in the ranking total part 37. This result is accumulated to the ranking result sending part 38.

[0050]If the televiewer of the television set 1 operates the ranking information demand switch 24 and demands information of the server 2, a result will be sent out from the ranking result sending part 38 to the ranking information receive section 25. The ranking information receive section 25 enables the following processings based on this received result.

[0051](A) When information is transmitted to the ranking information indicator 26 from the recommendation ranking information receive section 25 of viewing and listening of a specific channel, or a request to print out files, the ranking information indicator 26, Together with the auxiliary information relevant to the viewing channel information from the electronic program guide accumulating part 17, information is given to the picture display part 12 and the voice output part 13, and change of the channel under present viewing and listening and a future viewing-and-listening request to print out files are encouraged to a televiewer by visual or acoustical display. The channel encouraged at this time may be carried out to to the 10th place of a ranking higher rank not only in one, for example. A channel change and a future request to print out files are direct-control-possible for a televiewer in the channel selection section 18 based on these recommendation.

[0052](B) Carry out the direct control of the channel control unit 20 from the direct control or the direct request-to-print-out-files ranking information receive section 25 of a viewing-and-listening channel, make a forcible change of the channel under present viewing and listening, or throw reservation data into the channel subscription department 19 directly. At this time, a program to tell a televiewer is not set to one,

but may have a prescribed period, for example, the method of displaying each program in zapping form every 20 seconds, in the 10th place of a ranking higher rank.

[0053]In addition, in the server 2, to which program the televiewer group who has what kind of taste further is viewing and listening, or whether it is a viewing-and-listening schedule can grasp as a ranking totaled result. As for this information, it is variously available to take out from the server 2, for example, to be popular ranking of a channel or a program or to use for a program advertisement etc.

[0054]The effect in particular described above is restricted to neither a television set nor a television tuner, and can be used for apparatus, radio, etc. which have a recording function of the television called a video cassette recorder and a personal video recorder, for example. Although the above explanation explained as a "televiewer", even if it replaces with the "viewing-and-listening household" who consists not only of an individual but of two or more family structure members and thinks, it is substantially the same, and a viewing-and-listening household is included as a meaning of a televiewer's words used by this invention.

[0055]If the data which should total as a viewing history is made into the broadcasting station name which made the program instead of a channel number, a minute viewing history can consist of nationwide scales more. Namely, although it can view and listen to an identical program by the same channel on a scale of whole extent of Japan in BS and CS satellite broadcasting, and Internet broadcasting, In a terrestrial wave or CATV, if it is going to perform the statistical televiewer classification by the server 2 by a nationwide scale in order to view and listen to an identical program with a different channel number for every district, the accuracy of data will be lost.

[0056]So, by the server 2, how to perform amendment of a channel number based on the electronic program guide which came to hand from the broadcasting station group 3 can be considered about the channel number of the viewing history which came to hand from each television set 1. For example, the program manufactured at A broadcasting station (channel A) of the stay in Tokyo of a certain time zone noting that there is a history that the local televiewer viewed and listened by the channel B at the time or another time, If the information that the manufacture origin of the program of that time zone of the channel B is A can extract from the data of an electronic program guide, about this program, data conversion from a channel number to a broadcasting station name will be performed as it is a program of A broadcasting station. If this conversion is possible, analysis by a lot of televiewer group data will be attained more by a nationwide scale, and a notice to a televiewer will be similarly attained irrespective of a broadcast channel or a broadcasting date about a program

to encourage to a televiewer using an electronic program guide.

[0057]Drawing 3 is a processing flow chart of the server 2 in this embodiment. There are processing which roughly divides and classifies a televiewer according to the feature of a televiewer's taste as processing of the server 2 as mentioned above, and processing which encourages viewing and listening of a program using a televiewer's classification.

[0058]Drawing 3 (A) expresses televiewer sorting processing. First, the server 2 receives viewing history information from each television set 1, and accumulates it (Step S10). Next, based on the accumulated viewing history information, grouping of the televiewer is carried out and he is classified according to the feature of the taste to a view program (Step S11). The above processing is repeated a suitable cycle.

[0059]Drawing 3 (B) expresses recommendation processing of the program. First, the server 2 requires the channel numbers (or channel number etc. which will be a viewing-and-listening schedule further in the future) under present viewing and listening of each televiewer's television set 1 classified into the specific televiewer group (Step S20). The response from each television set 1 is received, and the channel information under present viewing and listening is collected with each television set 1 (Step S21). Next, a ranking total is carried out at the order of what has many [channels / (or channel etc. which will be a viewing-and-listening schedule further in the future) / to which it is viewed and listened now] numbers of viewing and listening (Step S22). When the transmission request of ranking information occurs from the television set 1, it transmits to the television set 1 of ranking result demand-origin (Step S23, S24). The above processing is repeated by making the next specific televiewer group into a processing object (Step S25).

[0060]A computer and a software program can realize the above processing and the program can be stored in suitable recording media, such as a portable medium memory which a computer can read, semiconductor memory, and a hard disk.

[0061]The feature of the above embodiment of the invention is as follows.

[0062](1) In the television reception system constituted from a television set being able to change the channel to which it views and listens with the directions from the external server connected via the communications network, and its external server, The circuit where a television set sends out a peculiar ID number for every television set, The timer which measures current time, and the memory part which accumulates an electronic program guide, The switch which chooses a receiving channel by operation of human being, and the circuit which accepts the directions from an external server and controls a receiving channel, The television broadcasting tuner

which can change a receiving channel based on control, The communication circuit which sends out the channel information under present reception to an external server, and the memory which accumulates the past channel selection history, The communication circuit which sends out the history to an external server, and the switch which requires ranking information of an external server by a televiewer's operation, The memory which receives ranking information by communication with an external server, and is memorized, Comprise a circuit which displays ranking information, and the indicator and voice response circuit which turn the output of a television tuner and ranking information to a televiewer, and display it, and an external server, The memo which accumulates the communications department in which communication with the television set installed in each viewing-and-listening household is possible, and each televiewer's viewing history, respectively. Li and the calculation part which classifies a televiewer based on a viewing history and a discriminant, The memory which classifies each televiewer as a group and accumulates him based on a standard of classification, The memory which gathers [which channel each televiewer's television set has chosen now, and] information, The calculation part which totals the present viewing-and-listening channel in majority form for every televiewer group, Comprising a calculation part which generates the higher rank ranking of a broadcast channel based on the totaled result, and a circuit which turns the ranking result to each televiewer's television set, and sends it out, an external server classifies a televiewer's taste and encourages viewing and listening of broadcast to a televiewer.

[0063](2) With the directions from the external server connected via the communications network. In the television reception system constituted from the television set and server being able to reserve the channel which will view and listen to the channel to which it views and listens change or in the future, To the composition of said television reception system, said television set, The circuit which accepts operation of human being or the directions from an external server, and can reserve the channel which will be a viewing-and-listening schedule in the future as a control system of the receiving channel of a television broadcasting tuner, Add, and only the channel information under present reception is constituted and the communication circuit which sends out the channel information which will be a viewing-and-listening schedule without ** in the future to an external server said server, The memory which gathers information also about the channel which each televiewer's television set not only has chosen which channel now, but will be a viewing-and-listening schedule in the future, For every televiewer group, the

calculation part which totals a present viewing-and-listening channel and future viewing-and-listening schedule channel in majority form, and the calculation part which generates the higher rank ranking based on the totaled result are added, and it is constituted.

[0064](3) Use a vector quantization algorithm about the classifying method of the above (1) or the televiewer group in (2).

[0065](4) In the above (1) or (2), use together the information on a channel and an electronic program guide, and show the ranking result shown to a televiewer as program information.

[0066]

[Effect of the Invention]As stated above, while this invention grasps a televiewer's taste from the viewing history of the televiewer of a television set, After classifying to a televiewer group with the same taste, when a specific televiewer group totals the program to which it will view and listen now or in the future in majority form and presents the total ranking result to a television set, (1) (2) which the viewing-and-listening purpose makes shorten the time of a fluid televiewer's zapping, and derives to the purpose program and channel near taste promptly, in order to present a subject share of a televiewer group with the same taste, (3) promptly derived to the program and channel which many televiewers are looking at -- as a result of these, It has the effect that to what kind of channel or program the specific televiewer group is viewing and listening or whether it being a viewing-and-listening schedule, and ranking data are externally available.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a figure showing the embodiment of the television reception system which consists of the television set and server which carry out this invention.

[Drawing 2]It is a figure explaining the channel number which should be recorded in a viewing history accumulating part.

[Drawing 3]It is a processing flow chart of the server in this embodiment.

[Description of Notations]

1 Television set

2 Server

3 Broadcasting station group

11 Tuner unit

12 Picture display part

13 Voice output part

14 Communications department

15 Peculiar ID generation part

16 Timer

17 Electronic program guide accumulating part

18 Channel selection section

19 Channel subscription department

20 Channel control unit

21 The present viewing-and-listening channel sending part

22 Viewing history accumulating part

23 Hysteresis information sending part

24 Ranking information demand switch

25 Ranking information receive section

26 Ranking information indicator

31 Communications department

32 Viewing history accumulating part

33 TelevIEWER distinction calculation part

34 TelevIEWER classification part

- 35 The present viewing information demand part
- 36 Viewing-and-listening channel voting parts
- 37 Ranking total part
- 38 Ranking result sending part
- 39 Electronic program guide sending part